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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,921	10/24/2003	Eric A. Johnson	END920010133US1 (15171)	9037
23389	7590	11/16/2005	EXAMINER DUPUIS, DEREK L	
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530			ART UNIT 2883	
PAPER NUMBER				

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,921

Applicant(s)

JOHNSON ET AL.

Examiner

Derek L. Dupuis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-12 and 15-23 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-12 and 15-20 is/are rejected.
- 7) ☒ Claim(s) 1 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/24/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see pages 8 and 9, in combination with the amendments to the claims and the specification filed 9/2/2005, with respect to the objection to claims 2-10 and 12-20, the objection to the disclosure, and the rejection of claims 1, 5, 6, 11, 15, and 16 under 35 U.S.C. 112 have been fully considered and are persuasive. The objection the claims 2-10 and 12-20, the objection to the disclosure, and the rejection of claims 1, 5, 6, 11, 15, and 16 under 35 U.S.C. 112 have been withdrawn.
2. Applicant's arguments filed 9/2/2005 concerning the objection to the IDS have been fully considered but they are not persuasive. The information disclosure statement received on 10/24/2003 did not include any accompanying documents. Since no foreign documents were received, the examiner considered only those that could be obtained through PTO databases. Those references that the examiner could not find English abstracts of in the PTO databases were not considered and were consequently "lined through".
3. Applicant's arguments filed 9/2/2005 concerning the rejection of claims 1, 3, 4, 8, 11, 13, 14 and 18 under 35 U.S.C. 102(e) and the rejection of claims 2, 5-7, 9, 10, 12, 15-17, 19, and 20 under 35 U.S.C. 103(a) have been fully considered but they are not persuasive. In pages 9 and 10 the applicant argues that Towle et al do not teach the C4 connection as cited in the claim. The examiner respectfully disagrees. C4 joints are simply "controlled collapsible chip connections". As is known to one with skill in the art, the solder joint 118 taught by Towle et al is a type of C4 joint although it is not explicitly stated to be such. The joint includes an optical solder blob 118 that is used to bond a transmitter/receiver chip to the cladding layer of a waveguide as can be

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seen in the figures. The joint is a controlled collapsible connection for a chip as its physical state is controlled by the application of temperature and the chip is collapsed onto the waveguide cladding as the optical solder is snap thermal cured (see column 3, line 44 to column 4, line 65).

4. Applicant's amendment has cancelled claims 3, 4, 13, and 14.

5. The examiner is maintaining the grounds of rejection cited in the previous office action.

This rejection has been repeated below. Therefore, this rejection is made final.

Claim Objections

6. Claims 1 and 11 are objected to because of the following informalities: the limitation "at least one transmitter/receiver chip being coupled to said surface of said second cladding layer; and at least one transmitter/receiver chip being coupled to said surface of said second cladding layer through the interposition of C4-joints" should apparently be "at least one transmitter/receiver chip being coupled to said surface of said second cladding layer through the interpositions of C4-joints" so as to eliminate redundancy. Appropriate correction is required.

The new objection is necessitated by the applicant's amendment.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 8, 11, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by *Towle et al (US 6,834,133 B1)*.

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9. Towle et al teach an optoelectronic packaging and method of packaging as shown in figures 1 and 2. Towle et al teach a substrate (122) bearing a first surface and a first cladding layer (120) positioned on the first surface of the substrate (122). A contact pad (124) is positioned on a portion of the surface of the first cladding layer (120) and a second cladding layer including a waveguide channel (112) is positioned on a further surface portion of the first cladding layer (120). The package also includes an optical means (116) that is in optical communication with the waveguide channel (112) and is in electrical contact with the contact pad (124) as is shown in the figures. The optical element is mounted on a transmitter/receiver chip (114) that is coupled to the second cladding layer (112). Towle et al teach that the transmitter/receiver chip is flip chip bonded to the waveguide and contact pad (see column 3, line 44 to column 5, line 9). Flip chip bonding involves the use of C4 joints as is well known in the semiconductor art.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 9, 10, 12, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Towle et al (US 6,834,133 B1)* as applied to claims 1, 8, 11, and 18 above, and further in view of *Oono et al (US 2005/0105860 A1)*.

12. Towle et al teaches that the optoelectronic packaging is an PCB or an optoelectronic card used to align a waveguide and an optoelectronic device. However, Towle et al does not

explicitly state that the optoelectronic device is a VCSEL. Towle et al also does not teach that the cladding layers are organic. Oono et al teach an optoelectronic device that couples a VCSEL (15) to an optical waveguide (112) as shown in the figures. Oono et al also teaches to use organic materials in claddings (see paragraph 171).

13. It would have been obvious to one of ordinary skill in the art at the time of invention to use a VCSEL as taught by Oono et al and to use an organic material as a cladding as taught by Oono et al in the optoelectronic package taught by Towle et al. Motivation to do this is that VCSEL emit light signals in a very defined direction thus making them more efficient in coupling light. Motivation to use an organic material would be that organic materials are known in the art to be stronger and more durable than inorganic materials such as glass and silica.

14. Claims 5-7 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Towle et al (US 6,834,133 B1)* as applied to claims 1, 8, 11, and 18 above, and further in view of *Yoshizawa et al (US 2002/0084522 A1)*.

15. Towle et al teaches that an optical solder is used to couple light between the emitter and the waveguide. Towle et al teaches that the solder is optically transmissive in the same range as the waveguide. Towle et al do not teach that the substrate is made of a material consisting of either epoxy glass, thick yarns or a low-expansion s-glass with a CTE as low as 10ppm/degree so as to alleviate the strain at the C4 joints. Yoshizawa et al teach an optoelectronic package where the substrate is formed of a material having a low thermal expansion coefficient such as a glass-fiber epoxy resin that reduces the stress of the flip chip bond by reducing the difference between the CTE of the substrate and chip (see paragraph 21). Yoshizawa et al teaches that the CTE of the substrate can be as low as 10 ppm/degree (see paragraph 25).

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16. It would have been obvious to one of ordinary skill in the art at the time of invention to form the substrate of the device taught by Towle et al out of a material such as a glass-fiber epoxy resin as taught by Yoshizawa et al. Motivation to do this would be to reduce stress by reducing the difference in the thermal expansion between the semiconductor chip and the substrate (see paragraph 21).

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Derek L. Dupuis
Group Art Unit 2883



KAVEH KIANNI
PRIMARY EXAMINER